

WHAT IS CLAIMED IS:

1. A current drive device control circuit for controlling drive currents which flow in a plurality of current drive devices serially connected to a constant current power source, the circuit comprising:

5 a plurality of bypass circuits parallelly connected to each of said plurality of the current drive devices,

wherein each of said plurality of the bypass circuits controls a bypass current flowing in own circuit thereof and the drive currents of said current drive devices corresponding to the bypass circuits whose bypass currents are controlled.

10 2. A current drive device control circuit for controlling drive currents which flow in a plurality of current drive devices serially connected to a constant current power source, the circuit comprising:

a plurality of bypass circuits parallelly connected to each of said plurality of the current drive devices;

15 a plurality of current detection means for detecting any of a bypass current flowing in each of said plurality of the bypass circuits and a drive current flowing in each of said plurality of the current drive devices;

a plurality of comparative control means for generating a control signal by comparing a detection signal corresponding to a current detected by each of said
20 plurality of the current detection means with a reference signal for deciding a reference level of said drive current; and

a current control means for controlling the bypass current which flows in a corresponding bypass circuit out of said plurality of the bypass circuits, based on a level of the control signal output by each of said plurality of the comparative

control means.

3. A current drive device control circuit according to claim 2, the circuit comprising:

a composite current detection means for detecting a composite current of
5 drive currents flowing in said plurality of current drive devices and bypass
currents flowing in said plurality of bypass circuits; and

a composite current comparative control means for generating a composite
control signal by comparing a composite detection signal corresponding to the
composite current detected by said composite current detection means with a
10 composite reference signal for deciding a reference level of said composite current,

wherein said constant current power source controls a current amount
supplied to the plurality of the current drive devices, based on a level of the
composite control signal output by said composite current comparative control
means.

15 4. A current drive device control circuit according to claim 2, wherein each of
said plurality of current drive devices is a laser diode.

5. A current drive device control circuit according to claim 3, wherein each of
said plurality of current drive devices is a laser diode.

6. A current drive device control circuit according to claim 4 which comprises
20 a plurality of optical detection means for individually detecting a light amount
which each of said plurality of laser diodes emits, wherein at least one current
control means out of said plurality of current control means is controlled, based on
a level of the light amount detected by each of said plurality of the optical
detection means, and wherein the relevant current control means makes a

current amount of a bypass current, which flows in a corresponding bypass circuit, variable.

7. A current drive device control circuit according to claim 5 which comprises a plurality of optical detection means for individually detecting a light amount which each of said plurality of laser diodes emits, wherein at least one current control means out of said plurality of current control means is controlled, based on a level of the light amount detected by each of said plurality of the optical detection means, and wherein the relevant current control means makes a current amount of a bypass current, which flows in a corresponding bypass circuit, variable.

8. A current drive device control circuit according to claim 4, wherein said constant current power source is controlled, based on a level of a light amount detected by each of said plurality of optical detection means, and wherein a current amount supplied to said plurality of laser diodes is made variable by the relevant constant current power source.

9. A current drive device control circuit according to claim 5, wherein said constant current power source is controlled, based on a level of a light amount detected by each of said plurality of optical detection means, and wherein a current amount supplied to said plurality of laser diodes is made variable by the relevant constant current power source.

10. A current drive device control circuit according to claim 6, wherein said constant current power source is controlled, based on a level of a light amount detected by each of said plurality of optical detection means, and wherein a current amount supplied to said plurality of laser diodes is made variable by the

relevant constant current power source.

11. A current drive device control circuit according to claim 7, wherein said constant current power source is controlled, based on a level of a light amount detected by each of said plurality of optical detection means, and wherein a current amount supplied to said plurality of laser diodes is made variable by the relevant constant current power source.

12. A current drive device control circuit according to claim 4, wherein each of said plurality of current control means is configured of an FET, and wherein in said FET, a drain is connected to an anode of a corresponding laser diode out of said plurality of laser diodes; a source is connected to a cathode of the relevant laser diode; and a gate is connected to an output terminal of a corresponding comparative control means out of said plurality of comparative control means.

13. A current drive device control circuit according to claim 5, wherein each of said plurality of current control means is configured of an FET, and wherein in said FET, a drain is connected to an anode of a corresponding laser diode out of said plurality of laser diodes; a source is connected to a cathode of the relevant laser diode; and a gate is connected to an output terminal of a corresponding comparative control means out of said plurality of comparative control means.

14. A current drive device control circuit according to claim 6, wherein each of said plurality of current control means is configured of an FET, and wherein in said FET, a drain is connected to an anode of a corresponding laser diode out of said plurality of laser diodes; a source is connected to a cathode of the relevant laser diode; and a gate is connected to an output terminal of a corresponding comparative control means out of said plurality of comparative control means.

15. A current drive device control circuit according to claim 7, wherein each of said plurality of current control means is configured of an FET, and wherein in said FET, a drain is connected to an anode of a corresponding laser diode out of said plurality of laser diodes; a source is connected to a cathode of the relevant laser diode; and a gate is connected to an output terminal of a corresponding comparative control means out of said plurality of comparative control means.

16. A current drive device control circuit according to claim 8, wherein each of said plurality of current control means is configured of an FET, and wherein in said FET, a drain is connected to an anode of a corresponding laser diode out of said plurality of laser diodes; a source is connected to a cathode of the relevant laser diode; and a gate is connected to an output terminal of a corresponding comparative control means out of said plurality of comparative control means.

17. A current drive device control circuit according to claim 9, wherein each of said plurality of current control means is configured of an FET, and wherein in said FET, a drain is connected to an anode of a corresponding laser diode out of said plurality of laser diodes; a source is connected to a cathode of the relevant laser diode; and a gate is connected to an output terminal of a corresponding comparative control means out of said plurality of comparative control means.

18. A current drive device control circuit according to claim 10, wherein each of said plurality of current control means is configured of an FET, and wherein in said FET, a drain is connected to an anode of a corresponding laser diode out of said plurality of laser diodes; a source is connected to a cathode of the relevant laser diode; and a gate is connected to an output terminal of a corresponding comparative control means out of said plurality of comparative control means.

19. A current drive device control circuit according to claim 11, wherein each of said plurality of current control means is configured of an FET, and wherein in said FET, a drain is connected to an anode of a corresponding laser diode out of said plurality of laser diodes; a source is connected to a cathode of the relevant laser diode; and a gate is connected to an output terminal of a corresponding comparative control means out of said plurality of comparative control means.

20. A solid laser apparatus which comprises a current drive device control circuit as described in any of claims 4 to 19, wherein a plurality of laser diodes in said current drive device control circuit are arranged at a circumference of a solid laser medium, and wherein the solid laser medium is configured so as to be excited by excitation lights from the plurality of the laser diodes.

21. A solid laser apparatus which comprises a current drive device control circuit as described in any of claims 4 to 19, wherein a plurality of laser diodes in said current drive device control circuit are arranged at circumferences of a plurality of solid laser media linearly arrayed, and wherein the plurality of the solid laser media are configured so as to be excited by excitation lights from the plurality of the laser diodes.